4-10 STANDARD SLAB BRIDGE - GENERAL INSTRUCTIONS

Makeup of Plans

1. General Plan

See Section 3, *Bridge Design Details* (BDD) manual. The "General Notes" are shown on the Slab Reinforcement Details sheet (xs1-220). These notes should be modified to conform to current standards.

2. Deck Contour

See Section 4, BDD manual.

3. Foundation Plan

See Section 5, BDD manual.

4. Abutments and Bent Details

See Section 6 & 7, BDD manual. Wingwalls details per Standard Plan B0-1 will generally be adequate.

Dropped bent caps (typically required in bridges with spans less than or equal to 24 feet) should be fully detailed showing the plan, elevation and section. For aesthetic reasons, the dropped portion of a bent cap should be terminated at least 1'-0" from edge of deck. For flush caps, the width of stirrups must be indicated.

5. Deck Details

Plan views of both top and bottom slab reinforcement are required. Indicate length, total number and placement data for each class of main reinforcing bars. Also show the typical section, the camber diagram, main reinforcing bars and a diagram for payment of concrete. A longitudinal deck sectional view is unnecessary since it is shown on "xs1-220".

6. Slab Reinforcement Details

Insert "xs1-220", with appropriate modifications, as a part of the Plans for every slab bridge. See Basis of Design – General Design Considerations.

7. Slab Hinge Details

See Basis of Design – Hinges. Insert "xs1-210", with appropriate modifications, as a part of the Plans when a hinge is required.

8. Railing Details

Refer to book of Standard Plans or insert appropriate sheets.

9. Reference to book of Standard Plans

The following sheets are required:

- A62-C "Limits of Payment for Excavation and Backfill-Bridge";
- B0-1 and B0-3 "Bridge Details".

Other sheets should be referenced as required.

10. Log of Test Borings

Insert "Log of Test Borings" sheet(s).

Basis of Design

The design considerations and the design assumptions made in developing the Slab Design Charts are summarized in the following sections.

1. Design Method

Load Factor Design based on Caltrans Bridge Design Specifications.

2. General Design Considerations

The design engineer shall ensure that the entire structural system meets *Caltrans Seismic Design Criteria* (SDC) requirements. Additional issues, including those described below, should be considered during analyses and design:

(i) The standard piles shown on the accompanying charts, (details are shown in the Standard Plans/ Charts) may not have sufficient longitudinal and transverse reinforcement to provide adequate strength and ductility for all load cases.

(ii) The top of the pile extensions/columns may either be fixed or pinned to the slab or bent cap. When the top of the pile extension/column is fixed, investigate the need for additional slab and bent reinforcement in accordance with SDC. Also, ensure that such a connection is properly engineered and detailed to provide adequate ductility and capacity.

(iii) For all load cases, when a pile/pile-column is designed to perform as a fixed connection at the top, ensure that the pile reinforcement can be properly anchored. In some cases, a bent cap may be required to provide the necessary development length.

(iv) The design engineer should calculate the camber (identified as "ultimate deflection" in the charts) for slab bridges having four or more spans. The camber values shown in the accompanying charts for such bridges shall not be used.

3. Distribution of Wheel Loads

The distribution of wheel loads conforms to Caltrans BDS Article 3.24.3.2 as appropriate.

4. Slab Thickness

The thickness of the slab is designed in accordance with Caltrans BDS Article 8.9.2.

5. Environmental Factor Z

An environmental factor of 170 kip/in. has been used in the charts. If the exposure condition is different (see BDS Articles 8.16.8.4 and 8.22), then the rebar distribution has to be verified.

6. Span Length

Actual span lengths are shown for all except "D" spans. For a span configuration of 18'-24'-18', the chart values for L=24' should be used for all 3 spans. "D" span values in the chart are based on (0.75)L or 18' in this case. For intermediate span lengths, interpolate between the values given in these charts.

7. Skew

The charts allow for skews of up to 50° for superstructure design. A special design is required when the skew angle exceeds 50°. Piles may have to be added at the abutments to support the obtuse corners of the slab. See "Support Design Data" and 'Typical Support Calculations" sheets.

In general, avoid skews over 30° (due to seismic concerns).

8. End Diaphragm Abutment

Abutment design is based on the recommendations in *Memo to Designers* (MTD) 5-2 with appropriate modifications per SDC. Effective longitudinal force is obtained by dividing the total force by effective abutment width.

9. Hinges

(i) In new slab bridges, if hinges are required, then they shall be properly engineered so that they are adequate for all load cases. In general, hinges should be located at the bents as shown in "xs1-210". The design engineer shall verify the adequacy of the details shown, and make suitable changes prior to inserting this sheet as a part of structure plans. Provide joint seal data, "A" bar size, and elastomeric bearing pad size.

(ii) In-span hinges should be avoided in new slab bridges. Such hinges have been used in the past to provide an unbroken soffit line for aesthetics. However, since slab bridges are typically not used as over-crossings/under-crossings, the relative merits of aesthetics and structural performance should be carefully considered

(iii) When widening slab bridges, design engineers should, in general, match new hinge locations with those on the existing bridge. Furthermore, if an existing slab bridge has a steel hinge, then the design engineer should consider incorporating a concrete hinge in the widening. Insert "xs1-210", and modify hinge details as required. Verify the adequacy of hinge details, including seat length, for all load cases.

(iv) Note that when an existing slab-bridge with in-span hinges is being widened, a longitudinal joint may be required if the design engineer chooses not to match existing hinge locations. Longitudinal bridge joints are strongly discouraged since they lead to performance and maintenance problems. Hence, this option may be considered only as a last resort.

10. Piles

In addition to the issues stated in **General Design Considerations** above, the following assumptions have been made for standard pile design used in the charts.

(i) Maximum unsupported length of pile-extension/column, including the effects from scour, is 25 feet.

(ii) Forces due to stream current and debris effects are not considered.

(iii) The pile is founded in compact sandy soil (or better) and/or stiff clay (or better).

(iv) Bridge response under the combined effects of seismic and scour (BDS 4.4.5.2) has not been considered.

(v) The live load demand on a pile-extension/column has been computed by distributing the live load reaction (from the slab) equally to all the columns in a bent. This assumption may not be valid for all cases. The design engineer should verify the validity of this assumption through analyses.

If the above assumptions do not apply, then a site-specific analysis and design will be required.

Insert "xs1-230" where appropriate. "xs1-230" shows the steel shell terminating below the ground line. If this detail is adequate from design considerations, then the Specifications may permit the contractor to extend the shell in which case the shell should terminate 2 to 4 inches below the soffit. The design engineer should convey this information to the specifications engineer through a "Memo-to-specifications engineer".

If a full height steel shell is required from design considerations, then the shell shall terminate 2 to 4 inches below the soffit line. Such a termination ensures that the ductility of the joint is not negatively impacted, and that a significant additional moment is not transferred to the slab. "xs1-230" should be modified accordingly.

11. Drainage

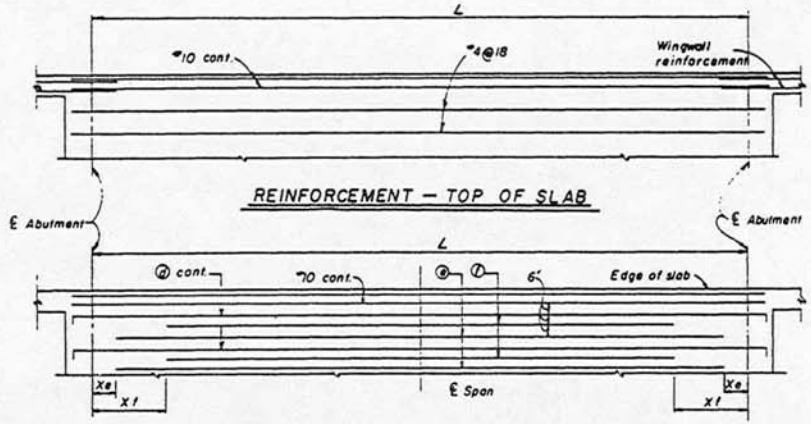
Scuppers or deck drains must be specially detailed when necessary.

12. Utilities

Refer to MTD 18-2 for details showing minor/small utilities in slab bridges. Contact Structure Maintenance and Investigations if a slab bridge needs to carry bigger utilities.

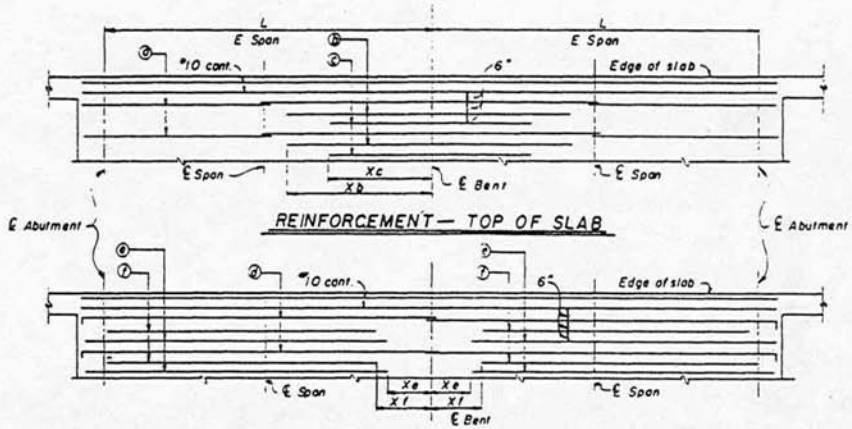
13. Quantities

The charts show approximate slab quantities for one lineal foot of slab width. The reinforcement for caps and end diaphragms as well as any concrete extending outside the slab limits is not included in these charts.



REINFORCEMENT — TOP OF SLAB

REINFORCEMENT — BOT. OF SLAB



REINFORCEMENT — TOP OF SLAB

REINFORCEMENT — BOTTOM OF SLAB

L = Length of Span			16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'
REINFORCEMENT	Bottom of Slab	⑤ bars	Size	#8	#8	#8	#8	#8	#8	#9	#9	#9	#9	#9	#9	#10	#10
			Length	Continous													
		② bars	Size	#7	#7	#8	#8	#8	#8	#8	#8	#9	#9	#9	#9	#9	#9
			Length	16'-0"	17'-0"	19'-0"	21'-0"	23'-0"	25'-0"	27'-0"	28'-0"	30'-0"	32'-0"	34'-0"	36'-0"	38'-0"	40'-0"	41'-0"
			Xe	0'-0"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	0'-6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"
		① bars	Size	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#9	#9	#9	#9	#9
			Length	13'-0"	14'-0"	15'-0"	16'-0"	17'-0"	19'-0"	20'-0"	22'-0"	23'-0"	23'-0"	25'-0"	28'-0"	28'-0"	29'-0"	30'-0"
			Xf	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	3'-6"	4'-0"	4'-0"	4'-6"	5'-6"	5'-6"	5'-0"	6'-0"	6'-6"	7'-0"
Distribution Steel Spacing				11"	11"	11"	11"	11"	11"	11"	11"	11"	11"	11"	11"	11"	11"	11"
T= Thickness of Slab ⑥				12 1/2"	13 1/2"	14 1/2"	15 1/2"	16 1/2"	17 1/2"	18"	19"	20"	21"	22"	23"	24 1/2"	26 1/2"	28"
Approximate Quantities per foot of width		Conc ft³		18.2	21.9	26.0	30.4	35.1	40.1	44.3	49.9	55.8	62.1	68.8	75.7	84.7	96.1	106.2
		Steel-lbs		105	115	735	150	160	190	215	235	260	275	290	330	340	380	400
Ultimate Deflection at Midspan Δ				.01'	.02'	.02'	.03'	.04'	.05'	.06'	.07'	.08'	.09'	.11'	.12'	.13'	.14'	.15'

⑥ Add 1/2" for "Corrosion Protection" & adjust concrete quantity.

SLAB DETAILS — SINGLE SPAN

Live Loading: HS 20-44 and Alternative and Permit Design Load.

L = Length of Span			16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'
REINFORCEMENT	Top of Slab	⑤ bars	Size	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#9	#9	#9
			Length	39'-8	43'-8"	47'-8"	51'-8"	56'-8"	63'-2"	67'-2"	71'-2"	75'-2"	82'-0"	86'-0"	90'-0"	94'-0"	98'-0"	107'-4"
		⑪ bars	Size	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#9	#9	#9	#10
			Length	13'-0"	14'-0"	15'-0"	17'-0"	15'-0"	15'-0"	16'-0"	18'-0"	20'-0"	18'-0"	19'-0"	20'-0"	21'-0"	22'-0"	24'-0"
			Xb	6'-6"	7'-0"	7'-6"	8'-6"	7'-6"	7'-6"	8'-0"	9'-0"	10'-0"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	12'-0"
		② bars	Size	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#9	#9	#9
			Length	7'-0"	7'-0"	7'-0"	8'-0"	7'-6"	8'-0"	8'-0"	9'-0"	10'-0"	11'-0"	11'-0"	12'-0"	12'-0"	13'-0"	13'-0"
			Xc	3'-6"	3'-6"	3'-6"	4'-0"	3'-6"	4'-0"	4'-0"	4'-6"	5'-0"	5'-6"	5'-6"	6'-0"	6'-0"	6'-6"	6'-6"
	Bottom of Slab	⑤ bars	Size	#7	#7	#8	#8	#8	#8	#8	#8	#8	#8	#8	#9	#9	#9	#9
			Length	39'-5	43'-5	48'-3	52'-3	56'-3	60'-3	64'-3	68'-3	72'-3	76'-3	80'-3	86'-6	90'-6	94'-6	98'-6
		② bars	Size	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#8	#8	#8	#8
			Length	15'-0"	16'-6"	17'-6"	18'-0"	20'-6"	22'-0"	23'-6"	24'-6"	26'-6"	28'-0"	29'-0"	28'-6"	29'-6"	31'-6"	32'-6"
			Xe	2'-0"	2'-6"	3'-0"	3'-0"	3'-6"	4'-0"	4'-0"	5'-0"	5'-6"	6'-0"	6'-0"	8'-0"	9'-0"	9'-0"	9'-6"
		① bars	Size	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#7	#7	#7	#8
			Length	11'-0"	12'-6"	12'-6"	14'-0"	15'-6"	15'-0"	16'-6"	17'-0"	19'-0"	21'-0"	21'-6"	22'-0"	21'-0"	23'-0"	25'-0"
			Xf	4'-0"	4'-6"	5'-6"	6'-0"	6'-6"	7'-6"	8'-0"	9'-0"	9'-6"	10'-0"	10'-0"	12'-0"	13'-6"	13'-6"	14'-0"
Distribution Steel Spacing				12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
T= Thickness of Slab ⑥				10 1/2"	11 1/2"	12"	13"	13 1/2"	14 1/2"	15"	16"	17"	17 1/2"	18 1/2"	19"	20"	21"	21 1/2"
Approximate Quantities per foot of width		Conc ft³		14.7	18.0	20.8	24.7	27.8	32.3	35.9	41.0	46.4	50.7	56.7	61.4	67.9	74.8	80.2
		Steel-lbs		140	160	180	195	215	230	265	290	325	350	375	420	430	450	535
Ultimate Deflection at Midspan Δ				.01'	.01'	.02'	.02'	.02'	.03'	.04'	.04'	.05'	.06'	.06'	.07'	.08'	.09'	.10'

⑥ Add 1/2" for "Corrosion Protection" & adjust concrete quantity.

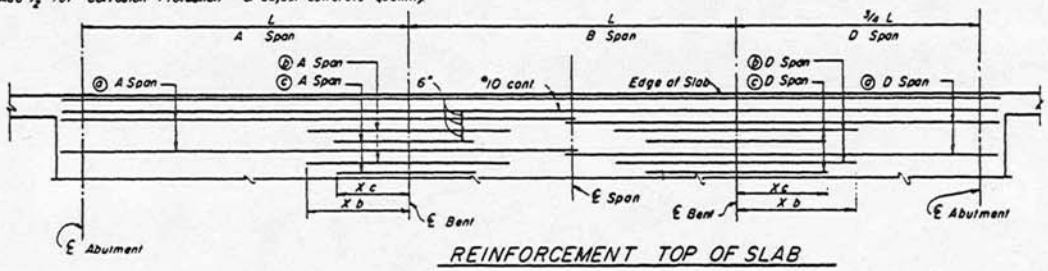
Live Loading: HS 20-44 and Alternative and Permit Design Load.

SLAB DETAILS — 2 SPANS

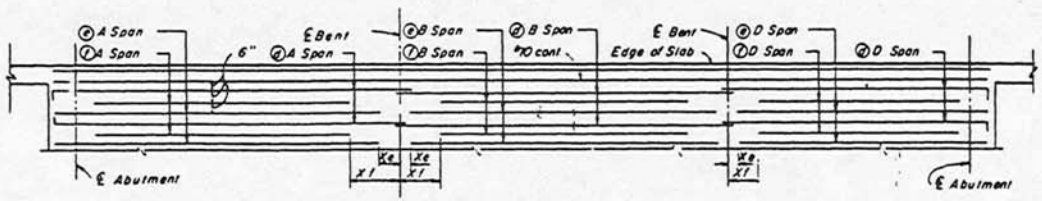
STANDARD SLAB BRIDGE
SLAB DETAILS - SINGLE & 2 SPAN

L = Length of Span			16'			18'			20'			22'			24'			26'			28'			30'			32'			34'			36'			38'			40'			42'			44'		
Type of Span			A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D
REINFORCEMENT	Top of Slab	a bars Size	#7	—	#6	#7	—	#6	#7	—	#7	#7	—	#7	#7	—	#7	#7	—	#7	#8	—	#7	#8	—	#7	#8	—	#7	#9	—	#7	#9	—	#8	#9	—	#8	#9	—	#8	#10	—	#9			
		a bars Length	26'-3"	—	23'-0"	24'-3"	—	24'-6"	25'-3"	—	27'-3"	25'-3"	—	29'-9"	26'-3"	—	32'-3"	41'-9"	—	35'-6"	45'-1"	—	37'-10"	48'-7"	—	40'-6"	51'-1"	—	42'-10"	54'-6"	—	45'-6"	57'-10"	—	48'-1"	61'-3"	—	50'-5"	70'-5"	—	55'-1"	77'-5"	—	95'-1"	78'-8"	—	58'-10"
		b bars Size	#7	—	#6	#7	—	#6	#7	—	#8	#7	—	#6	#7	—	#6	#7	—	#7	#7	—	#7	#8	—	#7	#8	—	#7	#8	—	#7	#9	—	#7	#9	—	#8	#9	—	#8	#9	—	#8	#9	—	#8
		b bars Length	11'-6"	—	12'-0"	12'-0"	—	12'-6"	14'-6"	—	11'-6"	15'-6"	—	12'-0"	17'-0"	—	12'-6"	19'-0"	—	13'-0"	17'-0"	—	17'-0"	19'-0"	—	17'-0"	20'-0"	—	17'-0"	19'-6"	—	18'-6"	19'-0"	—	18'-6"	23'-6"	—	17'-0"	23'-6"	—	18'-0"	23'-6"	—	20'-6"	24'-0"	—	20'-0"
		XD	5'-0"	—	8'-0"	5'-0"	—	7'-8"	6'-8"	—	7'-0"	6'-6"	—	7'-0"	7'-8"	—	8'-0"	8'-6"	—	8'-0"	8'-0"	—	9'-6"	8'-6"	—	9'-0"	9'-0"	—	9'-0"	9'-0"	—	10'-6"	9'-0"	—	9'-6"	11'-0"	—	10'-0"	11'-0"	—	10'-0"	11'-6"	—	11'-0"	10'-6"	—	10'-0"
	Bottom of Slab	c bars Size	#8	—	#8	#8	—	#6	#7	—	#8	#8	—	#6	#7	—	#8	#7	—	#8	#7	—	#6	#7	—	#6	#7	—	#6	#7	—	#7	#8	—	#7	#8	—	#7	#9	—	#7	#9	—	#8	#9	—	#8
		c bars Length	7'-0"	—	7'-6"	8'-0"	—	7'-0"	8'-0"	—	7'-0"	10'-0"	—	7'-0"	8'-6"	—	7'-0"	10'-0"	—	7'-6"	10'-6"	—	8'-0"	10'-6"	—	8'-0"	10'-6"	—	8'-0"	10'-0"	—	10'-0"	11'-6"	—	10'-0"	15'-0"	—	10'-0"	15'-0"	—	12'-6"	16'-0"	—	12'-6"	16'-0"	—	12'-6"
		X C	3'-6"	—	4'-0"	4'-0"	—	3'-6"	4'-0"	—	3'-6"	3'-6"	—	4'-0"	4'-0"	—	3'-6"	5'-0"	—	3'-8"	4'-6"	—	4'-0"	4'-6"	—	4'-0"	4'-6"	—	4'-0"	6'-0"	—	5'-0"	6'-0"	—	5'-0"	6'-6"	—	6'-0"	7'-6"	—	5'-0"	8'-0"	—	6'-6"	7'-6"	—	6'-6"
	Bottom of Slab	d bars Size	#7	#6	#6	#7	#6	#6	#8	#7	#6	#8	#7	#6	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#9	#7	#7	#8	#7	#7	#9	#7	#7	#9	#8	#7	#9	#8	#7
		d bars Length	18'-0"	16'-10"	15'-3"	21'-10"	20'-10"	16'-11"	24'-6"	23'-5"	18'-3"	26'-2"	25'-3"	19'-11"	28'-5"	27'-3"	21'-10"	30'-2"	29'-3"	23'-4"	32'-7"	31'-3"	24'-10"	34'-2"	33'-3"	26'-4"	36'-5"	35'-2"	28'-10"	38'-7"	37'-3"	29'-4"	40'-2"	39'-5"	30'-10"	42'-1"	41'-4"	32'-4"	43'-6"	42'-8"	33'-10"	45'-1"	43'-8"	35'-4"	46'-8"	45'-2"	36'-10"
		e bars Size	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#8	#6	#6	#8	#6	#6	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#9	#7	#7	#9	#7	#7	#9	#7	#7
		e bars Length	14'-6"	13'-0"	11'-0"	15'-0"	13'-6"	12'-6"	16'-6"	15'-0"	14'-0"	20'-0"	17'-0"	14'-0"	23'-0"	18'-0"	16'-0"	25'-0"	20'-0"	17'-0"	26'-0"	22'-0"	19'-6"	27'-6"	23'-0"	20'-0"	29'-0"	24'-0"	21'-0"	31'-6"	26'-0"	23'-0"	33'-0"	30'-0"	26'-0"	35'-0"	31'-0"	27'-0"	37'-0"	33'-0"	29'-0"	39'-0"	35'-0"	31'-0"	42'-0"	38'-0"	33'-0"
		X E	1'-6"	1'-6"	1'-0"	2'-0"	1'-6"	1'-0"	1'-0"	3'-0"	2'-6"	1'-6"	2'-6"	1'-0"	2'-0"	3'-0"	2'-0"	2'-0"	3'-0"	2'-6"	3'-0"	3'-0"	2'-0"	3'-0"	4'-0"	2'-6"	3'-6"	4'-0"	3'-0"	4'-0"	5'-0"	3'-0"	4'-6"	4'-6"	3'-6"	6'-0"	5'-0"	4'-0"	6'-0"	5'-6"	4'-6"	6'-6"	6'-6"	5'-0"	7'-0"	6'-6"	5'-0"
		f bars Size	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#8	#6	#6	#8	#6	#6	#8	#6	#6	#8	#6	#6	#8	#7	#6	#8	#7	#6	#9	#7	#6	#9	#7	#6	#9	#7	#6
		f bars Length	10'-6"	10'-0"	9'-0"	12'-6"	11'-0"	9'-6"	13'-0"	11'-0"	10'-6"	15'-0"	13'-0"	12'-6"	15'-6"	14'-0"	12'-0"	16'-0"	15'-0"	15'-0"	16'-6"	15'-0"	15'-0"	17'-0"	15'-0"	15'-0"	20'-5"	15'-0"	13'-0"	21'-6"	18'-0"	14'-0"	25'-0"	19'-0"	16'-0"	25'-0"	19'-0"	12'-6"	24'-0"	21'-0"	18'-0"	25'-0"	21'-0"	17'-6"	24'-6"	22'-0"	19'-6"
		X f	4'-0"	3'-0"	3'-6"	4'-0"	3'-6"	3'-0"	5'-0"	4'-6"	3'-0"	5'-0"	4'-6"	3'-0"	6'-0"	6'-0"	4'-6"	7'-0"	5'-6"	4'-6"	8'-0"	6'-6"	5'-6"	7'-0"	7'-6"	6'-6"	7'-6"	7'-0"	7'-0"	8'-0"	8'-6"	6'-0"	10'-0"	8'-6"	7'-6"	11'-0"	9'-6"	7'-6"	12'-6"	10'-0"	8'-6"	12'-6"	11'-0"	8'-6"			
Distribution Steel Spacing			12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
T = Thickness of Slab ⑧			10 1/2"			11 1/2"			12"			13"			13 1/2"			14 1/2"			15"			16"			17"			17 1/2"			18 1/2"			19"			20"			21"			21 1/2"		
Approximate Quantities PER FOOT OF WIDTH		Conc. (C.Y.)	14.7	14.1	11.2	18.0	17.3	13.7	20.8	20.0	15.8	24.7	23.8	18.7	27.8	27.0	21.1	32.4	31.4	24.0	36.1	35.0	27.3	41.7	40.0	31.7	47.1	45.3	35.8	51.4	49.6	39.0	57.4	55.3	43.6	62.2	60.2	47.1	68.8	66.7	52.1	75.7	73.5	57.3	81.1	78.8	61.4
		Steel (lbs.)	145	65	100	165	75	105	190	90	120	205	95	130	235	105	150	255	110	170	285	125	185	325	130	195	330	145	205	390	155	225	410	160	270	485	180	280	515	190	300	560	215	320	630	225	360
Ultimate Deflection @ Midspan Δ		A B A Spans	.01'	—	—	.02'	—	—	.02'	—	—	.03'	—	—	.04'	—	—	.04'	—	—	.04'	—	—	.05'	—	—	.06'	—	—	.07'	—	—	.08'	—	—	.09'	.01'	—	.10'	.01'	—	.11'	.01'	.00'	.13'	.01'	—
		D B D Spans	—	—	—	—	.01'	—	—	.01'	—	—	.01'	—	—	.02'	—	—	.02'	.01'	—	.02'	.01'	—	.02'	.01'	—	.03'	.01'	—	.04'	.02'	—	.04'	.02'	—	.04'	.02'	—	.05'	.02'	—	.05'	.02'	—	.06'	.03'
		A B D Spans	.01'	—	—	.02'	.01'	.01'	.02'	.01'	.01'	.03'	.01'	.01'	.03	.01'	.01'	.04'	.01'	.01'	.05'	.02'	.01'	.05'	.02'	.01'	.07'	.02'	.02'	.07'	.02'	.02'	.09'	.03'	.02'	.10'	.03'	.03'	.11'	.03'	.03'	.12'	.04'	.04'			

⑧ Add 1/2" for "Corrosion Protection" & adjust concrete quantity



REINFORCEMENT TOP OF SLAB



REINFORCEMENT BOTTOM OF SLAB

* Length includes allowance for one additional splice in 'A' or 'D' Span.

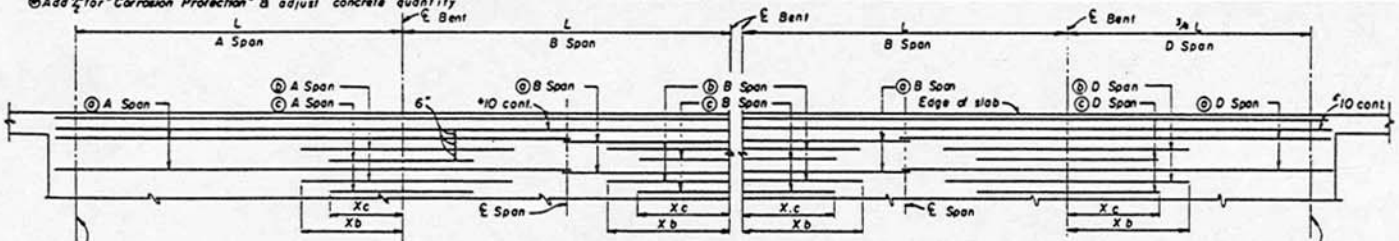
Note :
D Span lengths are actually 3/4 of the length shown in the heading. (Heading 24' : 'A' & 'B' Spans are actually 24', 'D' Span is 18')

Live Loading: HS 20-44 and Alternative and Permit Design Load

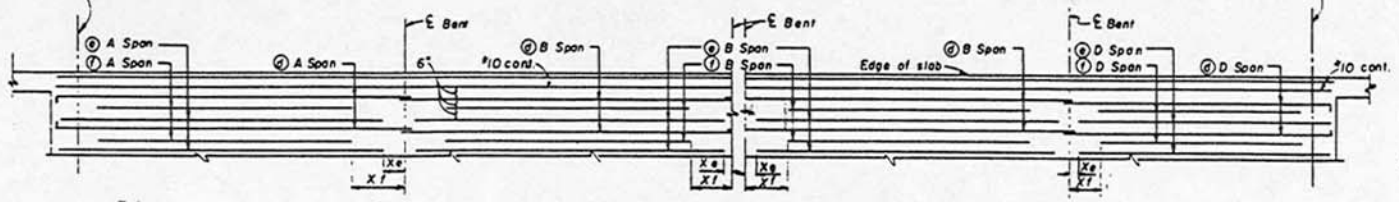
STANDARD SLAB BRIDGE
SLAB DETAILS - 3 SPANS

L = Length of Span			16'			18'			20'			22'			24'			26'			28'			30'			32'			34'			36'			38'			40'			42'			44'		
Type of Span			A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D	A	B	D
REINFORCEMENT	Top of Slab (Bars)	Size	#7	#6	#6	#7	#6	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#9	#8	#8	#9	#8	#8	#9	#9	#8	#10	#9	#9
		Length	2-6.5"	18'-10"	22'-0"	2-7.5"	20'-5"	24'-6"	2-8.5"	23'-5"	27'-5"	2-9.5"	25'-5"	29'-5"	2-10.5"	27'-5"	32'-5"	2-11.5"	30'-5"	35'-4"	2-12.5"	32'-5"	37'-4"	2-13.5"	34'-5"	40'-4"	2-14.5"	36'-5"	43'-4"	2-15.5"	38'-5"	45'-4"	2-16.5"	40'-5"	47'-4"	2-17.5"	42'-5"	49'-4"	2-18.5"	44'-5"	51'-4"	2-19.5"	46'-5"	53'-4"	2-20.5"	48'-5"	55'-4"
		Size	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#7	#6	#7	#7	#6	#7	#7	#7	#7	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#8	#7	#8	#8	#7	#9	#8	#8
		Length	11'-6"	13'-0"	15'-0"	12'-0"	14'-0"	16'-0"	14'-0"	16'-0"	11'-6"	15'-6"	12'-0"	12'-0"	17'-0"	13'-0"	12'-6"	19'-0"	14'-0"	15'-0"	17'-0"	15'-0"	17'-0"	19'-0"	16'-0"	17'-0"	20'-0"	18'-0"	17'-0"	19'-6"	17'-0"	15'-6"	19'-0"	17'-0"	19'-0"	22'-6"	19'-0"	19'-0"	24'-0"	20'-0"	19'-0"	25'-6"	21'-0"	19'-0"	27'-0"	22'-0"	19'-0"
		X b	5'-0"	7'-6"	8'-0"	5'-0"	7'-0"	7'-6"	6'-6"	5'-6"	6'-6"	7'-0"	6'-0"	6'-6"	7'-6"	6'-6"	6'-6"	8'-6"	7'-0"	8'-0"	8'-0"	7'-6"	8'-6"	8'-6"	8'-0"	9'-0"	9'-0"	9'-0"	9'-6"	10'-0"	9'-0"	9'-6"	10'-0"	9'-0"	10'-0"	10'-0"	9'-6"	10'-0"	11'-0"	10'-0"	10'-6"	11'-6"	10'-6"	10'-0"	12'-0"	10'-6"	10'-0"
	Bottom of Slab (Bars)	Size	#6	#6	#6	#6	#7	#6	#7	#6	#6	#6	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#7	#6	#7	#7	#6	#7	#7	#7	#8	#7	#7	#8	#7	#7	#8	#8	#7	#9	#8	#7	#9	#8	#8
		Length	7'-0"	8'-0"	7'-6"	8'-0"	7'-6"	7'-0"	8'-0"	7'-0"	7'-0"	7'-0"	8'-0"	7'-0"	8'-6"	8'-0"	7'-0"	10'-0"	8'-0"	7'-6"	10'-6"	7'-0"	8'-0"	10'-6"	8'-0"	8'-0"	10'-6"	9'-0"	8'-0"	10'-6"	9'-0"	10'-0"	11'-6"	10'-0"	10'-0"	12'-6"	10'-0"	10'-0"	13'-0"	11'-0"	10'-6"	14'-0"	11'-0"	10'-6"	15'-0"	11'-6"	10'-6"
		X c	3'-6"	4'-0"	4'-0"	4'-0"	3'-9"	3'-6"	4'-0"	3'-6"	3'-6"	3'-6"	3'-0"	3'-6"	4'-0"	3'-0"	3'-6"	5'-0"	3'-0"	3'-9"	4'-6"	3'-6"	4'-0"	4'-6"	4'-0"	4'-0"	4'-6"	4'-6"	4'-0"	5'-0"	4'-6"	4'-6"	5'-0"	4'-6"	5'-0"	6'-0"	4'-6"	5'-0"	6'-0"	5'-0"	5'-0"	6'-6"	5'-0"	5'-0"	6'-6"	5'-6"	5'-0"
	Bottom of Slab (Bars)	Size	#7	#6	#6	#7	#6	#6	#8	#7	#6	#8	#7	#6	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#8	#7	#9	#8	#8	#9	#8	#8
		Length	19'-0"	20'-10"	21'-5"	21'-10"	20'-10"	18'-11"	24'-5"	23'-5"	18'-5"	26'-5"	23'-5"	18'-11"	28'-5"	27'-3"	21'-10"	30'-5"	29'-5"	23'-4"	32'-5"	31'-5"	24'-10"	34'-5"	33'-5"	28'-4"	36'-5"	35'-5"	28'-10"	38'-5"	37'-5"	30'-10"	40'-5"	39'-5"	32'-4"	42'-5"	41'-5"	32'-4"	44'-5"	43'-5"	34'-10"	46'-5"	45'-5"	36'-10"	48'-5"	47'-5"	36'-10"
		Size	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#8	#6	#6	#8	#7	#6	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7
		Length	14'-6"	15'-0"	11'-0"	16'-0"	12'-0"	12'-6"	18'-6"	15'-0"	11'-0"	20'-0"	17'-0"	14'-0"	23'-0"	18'-0"	16'-0"	24'-0"	20'-0"	17'-0"	26'-0"	22'-0"	19'-6"	27'-6"	24'-0"	21'-0"	29'-6"	26'-0"	23'-0"	31'-6"	28'-0"	24'-6"	33'-0"	29'-0"	26'-0"	35'-0"	31'-0"	27'-0"	36'-0"	33'-0"	28'-0"	38'-0"	34'-0"	30'-0"	39'-6"	36'-0"	30'-0"
		X e	1'-6"	1'-6"	1'-0"	2'-0"	1'-6"	1'-0"	3'-0"	2'-6"	1'-6"	2'-6"	2'-6"	1'-0"	2'-0"	3'-0"	2'-0"	2'-0"	3'-0"	2'-6"	3'-0"	3'-0"	2'-0"	3'-0"	4'-0"	2'-6"	3'-6"	4'-0"	3'-0"	4'-0"	5'-0"	3'-0"	4'-6"	4'-6"	3'-6"	5'-0"	5'-0"	4'-0"	6'-6"	5'-0"	4'-0"	6'-6"	5'-0"	4'-0"	6'-6"	5'-6"	5'-0"
		Size	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#7	#6	#6	#8	#6	#6	#8	#6	#6	#8	#7	#6	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7	#8	#7	#7
		Length	10'-6"	10'-0"	9'-0"	12'-6"	11'-0"	9'-6"	13'-0"	11'-0"	10'-6"	13'-0"	13'-0"	12'-6"	15'-0"	14'-0"	12'-0"	16'-0"	15'-0"	13'-0"	16'-0"	15'-0"	13'-0"	20'-6"	15'-0"	13'-0"	22'-6"	18'-0"	14'-0"	23'-0"	19'-0"	16'-0"	23'-0"	19'-6"	15'-6"	24'-0"	20'-0"	18'-0"	24'-6"	22'-0"	19'-6"	27'-0"	23'-0"	21'-6"	27'-0"	25'-0"	21'-6"
		X f	4'-0"	5'-0"	5'-6"	4'-0"	5'-6"	5'-0"	5'-0"	4'-6"	3'-0"	5'-0"	4'-6"	3'-0"	6'-0"	5'-0"	4'-6"	7'-0"	5'-6"	4'-6"	8'-0"	6'-6"	5'-6"	7'-0"	6'-6"	5'-6"	7'-6"	7'-0"	6'-0"	8'-0"	7'-6"	6'-0"	8'-6"	8'-0"	7'-6"	9'-0"	8'-6"	7'-6"	11'-0"	9'-6"	7'-6"	12'-6"	10'-0"	8'-6"	12'-6"	11'-0"	9'-6"
Distribution Steel Spacing			12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
T Thickness of Slab ⑥			10 1/2"			11 1/2"			12"			13"			13 1/2"			14 1/2"			15"			16"			17"			17 1/2"			18 1/2"			19"			20"			21"			21 1/2"		
Approximate Quantities per foot of width		Conc ft 3	14.7	14.1	11.2	18.0	17.3	13.7	20.8	20.0	15.8	24.7	23.8	18.7	27.8	27.0	21.1	32.4	31.4	24.0	36.1	35.0	27.3	41.7	40.0	31.7	47.1	45.3	35.8	51.4	49.6	39.0	57.4	55.3	43.6	62.2	60.2	47.1	68.8	66.7	52.1	75.7	73.5	57.3	81.1	78.8	61.4
		Steel lbs	145	107	100	165	120	105	190	140	120	205	150	130	235	165	150	255	175	170	285	200	185	325	210	195	330	230	205	390	260	225	410	275	270	485	310	280	515	330	300	560	385	320	630	405	360
Ultimate Deflection at Midspan Δ		A B A Spans	.01"	—	—	.02"	—	—	.02"	—	—	.03"	—	—	.04"	—	—	.04"	—	—	.04"	—	—	.05"	—	—	.06"	—	—	.07"	—	—	.08"	—	—	.09"	.01"	—	.10"	.01"	—	.11"	.01"	.00"	.13"	.01"	—
		D B D Spans	—	—	—	—	.01"	—	—	.01"	—	—	.01"	—	—	.02"	—	—	.02"	.01"	—	.02"	.01"	—	.02"	.01"	—	.03"	.01"	—	.04"	.02"	—	.04"	.02"	—	.04"	.02"	—	.05"	.02"	—	.05"	.02"	—	.06"	.03"
		A B D Spans	.01"	—	—	.02"	.01"	.01"	.02"	.01"	.01"	.03"	.01"	.01"	.03"	.01"	.01"	.04"	.01"	.01"	.05"	.02"	.01"	.05"	.02"	.01"	.07"	.02"	.02"	.07"	.02"	.02"	.09"	.03"	.02"	.10"	.03"	.03"	.11"	.03"	.03"	.12"	.04"	.04"			

⑥ Add ½" for "Corrosion Protection" & adjust concrete quantity



REINFORCEMENT–TOP OF SLAB



REINFORCEMENT–BOTTOM OF SLAB

Length includes allowance for one additional splice in 'A' or 'D' Spans.

NOTES:

Top reinforcement for 'B' Span to be modified when adjacent to a hinge. See "Slab Details" sheet.

'D' Span lengths are actually ¾ of the length shown in the heading. (Heading 24' 'A' & 'B' Spans are actually 24', 'D' Spans are 18'.)

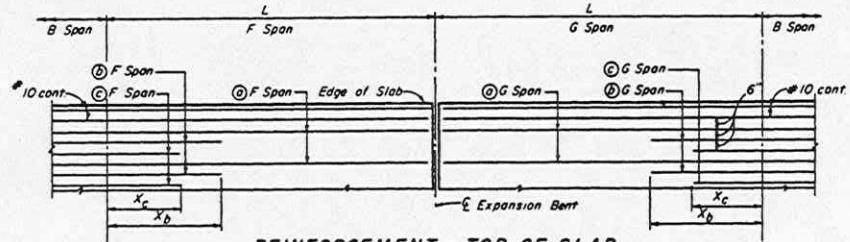
Live Loading: H S 20-44 & alternative and Permit Design Load.

STANDARD SLAB BRIDGE
SLAB DETAILS - MULTI SPAN

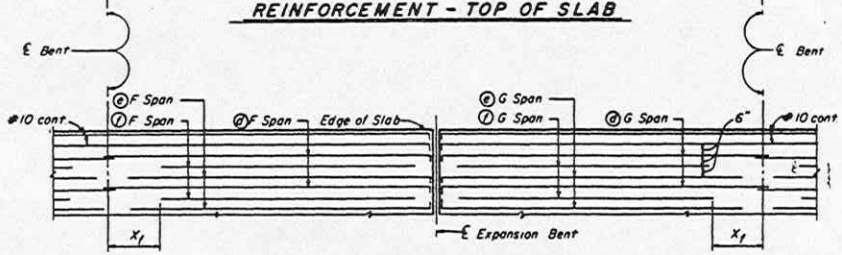
L = Length of Span			16'		18'		20'		22'		24'		26'		28'		30'		32'		34'		36'		38'		40'		42'		44'	
Type of Span			F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G	F	G
REINFORCEMENT	Top of Slab	ⓑ bars	Size	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#8	#9	#9	#9	#9	#9	#9	#9	#9	#9	#9	#9	#9
			Length	25'-6"	25'-6"	28'-6"	28'-6"	31'-6"	31'-6"	34'-6"	34'-6"	37'-6"	37'-6"	40'-6"	40'-6"	44'-3"	44'-3"	47'-3"	47'-3"	50'-3"	50'-3"	54'-0"	54'-0"	57'-0"	57'-0"	60'-0"	60'-0"	*69'-6"	*69'-6"	*72'-6"	*72'-6"	*75'-6"	*75'-6"
		ⓐ bars	Size	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#8	#8	#8	#9	#9	#9	#9	#9	#9	#9	#9
			Length	11'-6"	11'-6"	12'-0"	12'-0"	13'-0"	13'-0"	13'-6"	13'-6"	15'-0"	15'-0"	16'-0"	16'-0"	14'-6"	14'-6"	15'-6"	15'-6"	16'-0"	16'-0"	15'-0"	15'-0"	15'-0"	15'-0"	16'-6"	16'-6"	18'-0"	18'-0"	19'-6"	19'-6"	21'-0"	21'-0"
			X_b	5'-0"	5'-0"	5'-0"	5'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-6"	6'-6"	7'-0"	7'-0"	6'-6"	6'-6"	6'-6"	6'-6"	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	8'-0"	8'-0"	8'-6"	8'-6"	9'-0"	9'-0"	10'-0"	10'-0"
		ⓒ bars	Size	#6	#6	#6	#6	#6	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#9	#9	#9	#9	#9	#9
			Length	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-6"	6'-6"	7'-6"	7'-6"	6'-6"	6'-6"	6'-6"	6'-6"	8'-0"	8'-0"	8'-0"	8'-0"	8'-6"	8'-6"	9'-0"	9'-0"	12'-0"	12'-0"	12'-0"	12'-0"	12'-0"	12'-0"
			X_c	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	4'-0"	4'-0"	3'-0"	3'-0"	3'-0"	3'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-6"	4'-6"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"
	Bottom of Slab	⑤ bars	Size	#7	#7	#7	#7	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#9	#9	#9	#9	#9	#9	#9	#9
			Length	18'-6"	18'-6"	20'-6"	20'-6"	22'-9"	22'-9"	24'-9"	24'-9"	26'-9"	26'-9"	28'-9"	28'-9"	30'-9"	30'-9"	32'-9"	32'-9"	34'-9"	34'-9"	36'-9"	36'-9"	38'-9"	38'-9"	42'-0"	42'-0"	44'-0"	44'-0"	46'-0"	46'-0"	48'-0"	48'-0"
		② bars	Size	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#9	#9	#9	#9
			Length	15'-3"	15'-3"	16'-9"	16'-9"	17'-9"	17'-9"	19'-9"	19'-9"	21'-6"	21'-6"	23'-6"	23'-6"	25'-0"	25'-0"	26'-6"	26'-6"	28'-6"	28'-6"	30'-0"	30'-0"	31'-6"	31'-6"	32'-0"	32'-0"	33'-6"	33'-6"	35'-9"	35'-9"	37'-0"	37'-0"
			X_a	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		① bars	Size	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8
			Length	10'-6"	10'-6"	12'-6"	12'-6"	13'-0"	13'-0"	14'-0"	14'-0"	14'-0"	14'-0"	15'-0"	15'-0"	16'-6"	16'-6"	18'-0"	18'-0"	19'-0"	19'-0"	21'-0"	21'-0"	21'-6"	21'-6"	22'-0"	22'-0"	23'-0"	23'-0"	22'-6"	22'-6"	25'-0"	25'-0"
			X_f	4'-0"	4'-0"	4'-0"	4'-0"	5'-0"	5'-0"	5'-6"	5'-6"	7'-0"	7'-0"	7'-6"	7'-6"	8'-0"	8'-0"	8'-6"	8'-6"	8'-6"	8'-6"	9'-0"	9'-0"	9'-6"	9'-6"	11'-0"	11'-0"	12'-0"	12'-0"	13'-6"	13'-6"	13'-6"	13'-6"
Distribution Steel Spacing			12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
Approximate Quantities per ft. of width		Conc. ft.³	15.9	15.9	19.1	19.1	21.9	21.9	25.7	25.7	28.9	28.9	33.3	33.3	36.9	36.9	41.9	41.9	47.2	47.2	51.5	51.5	57.4	57.4	62.1	62.1	68.6	68.6	75.4	75.4	80.7	80.7
		Steel-lbs.	150	150	165	165	190	190	205	205	230	230	250	250	285	285	325	325	340	340	385	385	425	425	460	460	510	510	550	550		
Thickness of Slab ⑥			10 1/2"		11 1/2"		12"		13"		13 1/2"		14 1/2"		15"		16"		17"		17 1/2"		18 1/2"		19"		20"		21"		21 1/2"	
Ultimate Dead Load Deflection @ ℄ Span			.01	.01	.02	.02	.02	.02	.03	.03	.04	.04	.04	.04	.06	.06	.06	.06	.07	.07	.09	.09	.10	.10	.12	.12	.13	.13	.14	.14	.16	.16

⑥ Add '½" for "Corrosion Protection" & adjust concrete quantity.

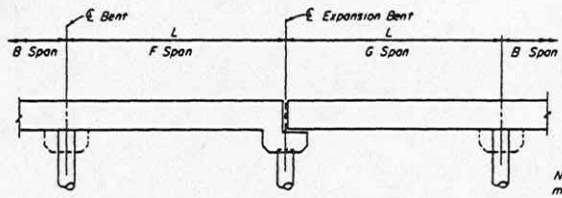
*Length includes one additional splice in 'F' & 'G' Spans.



REINFORCEMENT - TOP OF SLAB



REINFORCEMENT-BOTTOM OF SLAB



Note: F & G Span "L" must equal B Span "L"

LONGITUDINAL SECTION

See "SLAB HINGE DETAILS" sheet for information regarding cap and bearing seat.

LIVE LOADING: HS 20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD.

STANDARD SLAB BRIDGE

SLAB DETAILS - HINGE AT BENT

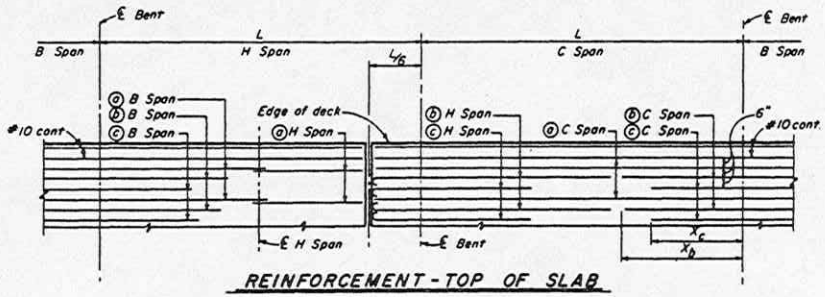
L = Length of Span			16'		18'		20'		22'		24'		26'		28'		30'		32'		34'		36'		38'		40'		42'		44'	
Type of Span			H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
REINFORCEMENT	Top of Slab	Ⓐ bars Size	#6	#6	#6	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#8	#8	#8	#8	#9	#8	#9	#9	#9	#9	#9
		Ⓐ bars Length	5'-7"	29'-3"	7'-3"	31'-3"	8'-2"	36'-6"	8'-10"	39'-9"	9'-6"	43'-0"	10'-8"	47'-6"	11'-4"	51'-0"	12'-0"	54'-3"	12'-8"	58'-9"	13'-8"	61'-6"	14'-4"	64'-9"	15'-0"	68'-3"	15'-8"	71'-6"	17'-1"	76'-3"	17'-9"	79'-6"
		Ⓑ bars Size	#7	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#7	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#8	#9	#8	#9
		Ⓑ bars Length	10'-9"	10'-0"	13'-3"	15'-0"	13'-3"	12'-6"	14'-0"	14'-0"	14'-9"	14'-6"	15'-9"	16'-6"	16'-3"	16'-6"	17'-0"	17'-6"	17'-3"	18'-0"	18'-9"	16'-0"	18'-0"	18'-0"	18'-9"	19'-6"	19'-9"	20'-0"	19'-0"	18'-0"	19'-6"	20'-0"
		Ⓑ bars X_b	–	4'-0"	–	7'-0"	–	5'-6"	–	6'-6"	–	6'-6"	–	7'-0"	–	7'-6"	–	8'-0"	–	8'0"	–	7'-0"	–	8'-0"	–	9'-0"	–	9'-0"	–	8'-0"	–	9'-6"
		Ⓒ bars Size	#6	#6	#6	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#7	#8	#7	#8	#7	#8	#8	#8
		Ⓒ bars Length	6'-3"	6'-0"	8'-3"	6'-0"	8'-9"	6'-0"	9'-6"	6'-0"	10'-3"	7'-0"	10'-9"	7'-0"	10'-0"	8'-0"	11'-0"	8'-0"	11'-3"	8'-0"	11'-0"	8'-0"	11'-9"	9'-0"	12'-9"	10'-0"	14'-3"	10'-0"	14'-0"	11'-0"	14'-0"	10'-0"
		Ⓒ bars X_c	–	3'-0"	–	3'-0"	–	3'-0"	–	3'-0"	–	3'-6"	–	3'-6"	–	4'-0"	–	4'-0"	–	4'-0"	–	4'-0"	–	4-6"	–	5'-0"	–	5'-0"	–	5'-0"	–	5'-0"
	Bottom of Slab	Ⓓ bars Size	#6	#7	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#8	#7	#8	#7	#8	#8	#8	#8	#8
		Ⓓ bars Length	14'-6"	20'-3"	16'-3"	22'-3"	18'-3"	24'-9"	19'-9"	27'-3"	21'-6"	29'-6"	23'-3"	31'-9"	24'-9"	34'-9"	26'-6"	36'-6"	28'-3"	38'-9"	29'-9"	41'-3"	31'-6"	43'-9"	33'-3"	45'-9"	34'-9"	48'-6"	37'-3"	50'-9"	38'-6"	53'-0"
		Ⓔ bars Size	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7	#7	#8	#7	#8	#7	#8	#7	#8	#7	#7	#7	#8	#7	#8	#7	#8	#7	#8
		Ⓔ bars Length	13'-0"	13'-6"	14'-3"	15'-6"	14'-0"	17'-0"	16'-0"	18'-6"	17'-9"	20'-6"	19'-0"	21'-6"	20'-9"	23'-0"	21'-9"	24'-6"	23'-6"	26'-0"	24'-9"	26'-6"	25'-9"	27'-0"	27'-6"	29'-0"	28'-0"	30'-0"	29'-0"	31'-0"	30'-6"	33'-6"
		Ⓔ bars X_e	–	2'-0"	–	3'-0"	–	2'-6"	–	3'-0"	–	3'-0"	–	3'-6"	–	3'-6"	–	4'-0"	–	4'-0"	–	5'-0"	–	6'-0"	–	6'-0"	–	6'-0"	–	7'-0"	–	7'-0"
		Ⓕ bars Size	#6	#6	#6	#6	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#6	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7	#7
		Ⓕ bars Length	9'-0"	9'-6"	10'-6"	10'-6"	10'-6"	13'-0"	11'-0"	13'-6"	11'-0"	14'-6"	12'-0"	16'-6"	14'-0"	16'-0"	13'-0"	17'-0"	16'-0"	17'-0"	17'-6"	19'-6"	18'-6"	21'-0"	19'-6"	19'-6"	21'-0"	21'-0"	19'-6"	21'-6"	21'-0"	24'-0"
		Ⓕ bars X_f	3'-0"	4'-6"	3'-6"	5'-0"	4'-6"	4'-6"	5'-0"	5'-6"	6'-0"	5'-6"	6'-0"	6'-0"	6'-6"	7'-6"	7'-0"	8'-0"	7'-6"	9'-0"	8'-0"	8'-6"	7'-6"	9'-0"	9'-6"	11'-0"	9'-0"	11'-0"	10'-6"	12'-0"	11'-0"	12'-0"
Approximate Quantities per ft of width		Conc. ft³	13.8	14.0	17.1	17.3	19.8	20.0	23.6	23.8	26.8	27.0	31.2	31.4	24.8	35.0	39.8	40.0	45.1	45.3	49.3	49.6	55.2	55.5	59.9	60.2	66.4	66.7	73.2	73.5	78.5	78.8
		Steel-lbs.	5.3	12.5	10.0	14.5	11.5	18.0	12.5	19.5	14.5	21.0	15.5	22.5	17.0	25.0	19.5	27.5	20.0	29.0	21.5	32.5	22.5	35.5	24.5	41.5	26.0	44.0	28.0	46.5	30.0	49.5
Thickness of Slab Ⓜ			10 1/2"		11 1/2"		12"		13"		13 1/2"		14 1/2"		15"		16"		17"		17 1/2"		18 1/2"		19"		20"		21"		21 1/2"	
Ultimate Dead Load Deflection @ ℄ Span			.01	.01	.01	.01	.01	.01	.01	.02	.01	.02	.02	.02	.02	.03	.03	.03	.03	.04	.04	.05	.04	.05	.05	.06	.05	.07	.06	.08	.06	.09

Ⓜ Add ½" for "Corrosion Protection" & adjust concrete quantity.

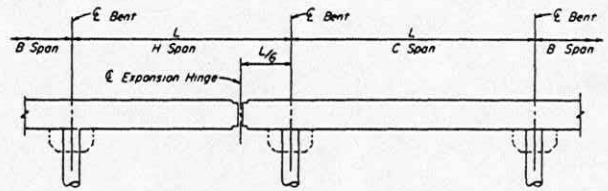
Length includes allowance for one additional splice in 'C' Span

NOTES :

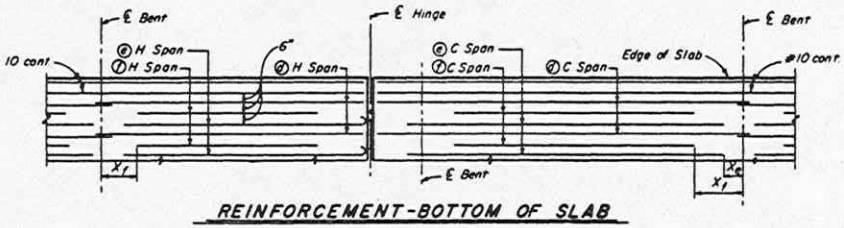
1. Section A-A on the "Slab Hinge Details" sheet illustrates a 1¼" opening. The actual amount of expansion provided for is 1" The 1¼" opening for example, allows for the expansion in 330 ft. of structure for a 40° temperature change (1"). If a larger opening is required, a revision must be made.
2. H Span deflection is at ℄ between Hinge and Bent.
3. See "Slab Hinge Details" sheet for information regarding the metalwork at the hinge.
4. Distribution Steel spacing, #5 @12.



REINFORCEMENT - TOP OF SLAB



LONGITUDINAL SECTION



REINFORCEMENT - BOTTOM OF SLAB

LIVE LOADING : HS 20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD

STANDARD SLAB BRIDGE
SLAB DETAILS - HINGE AT L/6

Unfactored Loads	Support Type	LENGTH OF SPAN "L"															
		16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'	
Slab Dead Load Reaction (kips per foot width of slab Includes 35 #/ft.² AC surfacing)	(I)	1.06	1.29	1.48	1.74	1.96	2.25	2.55	2.82	3.17	3.45	3.83	4.14	4.56	5.00	5.35	
	(II)	3.04	3.68	4.24	4.97	5.57	6.44	7.12	8.06	9.06	9.87	10.96	11.84	13.04	14.29	15.28	
	(III)	2.70	3.26	3.76	4.42	4.97	5.72	6.33	7.24	8.06	8.87	9.15	10.64	11.71	12.84	13.60	
	(IV)	.74	.90	1.04	1.22	1.37	1.58	1.75	1.97	2.22	2.42	2.69	2.90	3.20	3.51	3.75	
	(V)	3.32	4.03	4.63	5.49	6.12	7.03	7.78	8.81	9.90	10.78	11.99	12.95	14.24	15.62	16.7	
	(VI)	2.12	2.56	2.94	3.45	3.87	4.45	4.94	5.58	6.28	6.84	7.60	8.20	9.03	9.89	10.58	
	(VII)	1.53	1.83	2.16	2.52	2.90	3.30	3.64	4.08	4.56	5.06	5.58	6.13	6.82	7.69	8.47	
Live Load Reaction HS 20-44 B alt (kip per lane) (no impact)	(I)	40.60	41.42	42.06	42.50	43.03	43.70	45.00	46.50	47.80	490	50.1	51.1	52.0	52.9	53.5	
	(II)	47.0	49.9	52.6	55.4	57.5	59.5	61.0	62.3	63.4	64.3	65.1	65.8	66.4	66.9	67.1	
	(III)	50.2	50.9	52.4	54.7	57.4	59.7	60.4	62.3	63.3	64.7	65.8	66.8	67.7	68.5	69.1	
	(IV)	40.3	41.6	42.7	43.6	44.5	42.0	42.4	42.8	43.1	43.6	44.6	45.6	46.7	47.7	48.6	
	(V)	48.2	51.4	53.5	56.4	58.6	60.4	61.9	63.1	64.0	64.9	65.5	66.2	66.7	67.2	67.4	
	(VI)	40.9	41.6	42.3	42.9	44.9	47.3	48.2	51.5	50.9	52.0	56.2	55.1	54.9	55.7	56.2	
	(VII)	42.0	42.7	43.2	43.6	45.3	46.8	48.0	49.6	51.0	52.2	53.3	54.3	55.2	56.0	56.5	
Live Load Reaction P-Loads (kip per lane) (no impact)	(I)	48.0	48.0	50.8	53.5	56.1	58.5	60.6	62.6	64.4	66.0	67.5	70.2	72.9	75.3	77.5	
	(II)	55.0	62.6	68.2	72.5	79.2	86.7	93.0	98.4	103.9	110.9	117.5	123.7	129.2	135.7	142.2	
	(III)	58.3	61.2	64.6	70.3	75.8	87.8	89.5	95.9	101.9	107.5	114.1	121.0	127.4	133.3	138.7	
	(IV)	48.0	48.0	48.0	48.0	48.0	50.2	52.3	54.4	56.4	58.2	59.9	61.5	62.9	64.3	65.5	
	(V)	58.9	66.0	71.0	75.2	83.2	90.8	97.2	102.5	107.9	116.0	122.6	129.1	134.3	141.7	148.6	
	(VI)	48.0	48.5	52.8	57.4	62.0	66.5	71.0	75.2	79.2	83.1	86.7	91.4	95.9	100.2	104.7	
	(VII)	48.0	48.0	52.8	56.7	60.0	62.7	65.2	67.2	69.0	70.6	72.0	75.8	79.2	82.2	84.7	
IMPACT		.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	
2 SPANS ONLY	(I)	6.01	6.74	7.48	8.24	9.00	9.75	10.49	11.24	11.99	12.76	13.51	14.26	15.00	15.75	16.50	
Uniform Load Reaction Coefficient, Use for railing, curbs, sidewalk (per span)	(I)	6.40	7.21	8.00	8.80	9.59	10.40	11.21	12.00	12.79	13.59	14.40	15.20	15.99	16.81	17.60	
	(II)	18.31	20.62	22.90	25.19	27.43	29.76	32.01	34.32	36.60	38.87	41.17	43.45	45.75	48.03	50.31	
	(III)	16.23	18.28	20.34	22.36	24.41	26.47	28.46	30.50	32.56	34.55	36.62	38.67	40.67	42.73	44.78	
	(IV)	4.47	5.06	5.61	6.17	6.73	7.29	7.87	8.40	8.99	9.55	10.09	10.66	11.22	11.79	12.34	
	(V)	19.97	22.52	25.02	27.78	30.01	32.48	34.98	37.48	39.99	42.49	45.02	47.52	49.98	52.14	54.99	
	(VI)	12.72	14.31	15.90	17.46	19.00	20.53	22.21	23.73	25.36	26.95	28.53	30.09	31.67	33.25	34.82	
	(VII)	8.01	9.00	9.99	11.01	12.01	13.01	14.00	15.01	15.99	17.00	17.99	19.00	20.00	21.00	21.99	
Cap dead Load (below slab sof(ft) (kip per lineal ft)	(I) (IV) (VII)	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	
	(II) (III) (V)	.51	.47	.45	.41	.39	–	–	–	–	–	–	–	–	–	–	
	(VI)	.68	.68	.68	.68	.68	.68	.68	.68	.68	.68	.68	.68	.68	.68	.68	
"b" (in inches)*	(II) (III)	36	36	36	36	36	52	54	57	60	61	64	66	69	72	73	
	(V)	36	36	36	36	36	52	54	57	60	61	64	66	69	72	73	
	Support Type	16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'	
		LENGTH OF SPAN "L"															

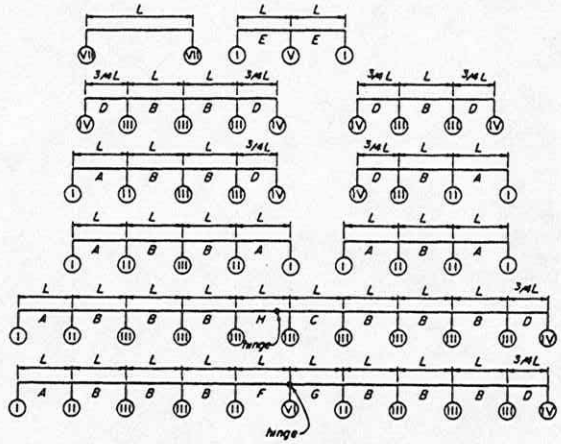
* See Support Design Data No. 2 sheet.

Support Type	Assumed Total Depth of Section
(I) (IV) (VII)	"T" plus 60"
(II) (III) (V) Spans 16'-24'	24"
(II) (III) (V) Spans 26'-44'	"T"
(VI)	"T" plus 18"

LIVE LOADING: HS 20-44 B ALTERNATIVE
AND PERMIT DESIGN LOAD

Skew Angle (In degree)	"K"
20-26	.34
27-32	.36
33-38	.38
39-44	.40
45-50	.42

REACTION COEFFICIENT "K"
SKEWED BRIDGES
To be used in pile calculation when bridge skew is 20° or more.

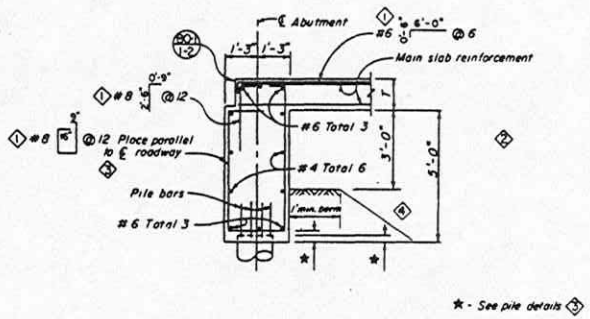


TYPICAL LAYOUTS
For determination of support types. Support type shown thus: ◯
Type of span shown thus: A

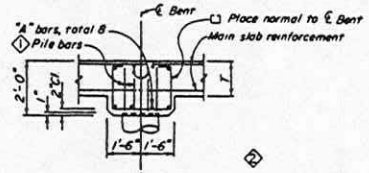
STANDARD SLAB BRIDGE
SUPPORT DESIGN DATA NO. 1

		Support Type	LENGTH OF SPAN "L"														
			16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'
BENT CAP	45T Pile Spacing *	(I)	10'-6"	9'-3"	8'-6"	7'-9"	7'-3"	6'-9"	6'-3"	5'-9"	5'-6"	5'-0"	—	—	—	—	—
	"A" bars (Skew 0°-20°)	(I)	#7	#7	#7	#7	#6	#6	#6	#6	#6	#6	—	—	—	—	—
	"A" bars (Skew 21°-35°)	(II)	#8	#7	#7	#7	#7	#7	#7	#6	#6	#6	—	—	—	—	—
	"A" bars (Skew 36°-50°)	(II)	#9	#8	#8	#7	#7	#8	#7	#7	#7	#6	—	—	—	—	—
	Stirrup Spacing	(II)	#5@10	#5@10	#5@10	#5@10	#5@10	#6@6	#6@6	#6@6	#6@6	#6@6	—	—	—	—	—
	70T Pile Spacing *	(II)	—	—	—	—	10'-6"	9'-6"	9'-3"	8'-6"	8'-0"	7'-6"	7'-0"	6'-6"	6'-0"	5'-6"	5'-6"
	"A" bars (Skew 0°-20°)	(II)	—	—	—	—	#9	#9	#9	#8	#8	#7	#7	#7	#7	#7	#7
	"A" bars (Skew 21°-35°)	(II)	—	—	—	—	#9	#10	#10	#9	#8	#8	#7	#7	#7	#7	#7
	"A" bars (Skew 36°-50°)	(II)	—	—	—	—	#10	#11	#11	#10	#9	#9	#8	#8	#7	#7	#7
	Stirrup Spacing	(II)	—	—	—	—	#6@10	#6@6	#6@6	#6@6	#6@6	#6@7	#6@7	#6@7	#6@8	#6@8	#6@8
	45T Pile Spacing *	(III)	10'-6"	9'-9"	9'-0"	8'-3"	7'-6"	7'-3"	7'-0"	6'-3"	5'-9"	5'-0"	—	—	—	—	—
	"A" bars (Skew 0°-20°)	(III)	#7	#7	#7	#7	#6	#7	#7	#6	#6	#6	—	—	—	—	—
	"A" bars (Skew 21°-35°)	(III)	#8	#7	#7	#7	#7	#7	#7	#6	#6	#6	—	—	—	—	—
	"A" bars (Skew 36°-50°)	(III)	#9	#8	#8	#8	#7	#8	#8	#7	#7	#6	—	—	—	—	—
	Stirrup Spacing	(III)	#5@10	#5@10	#5@10	#5@10	#5@10	#6@6	#6@6	#6@6	#6@6	#6@6	—	—	—	—	—
	70T Pile Spacing *	(III)	—	—	—	—	—	11'-0"	10'-0"	9'-3"	8'-6"	8'-0"	7'-6"	7'-3"	6'-6"	6'-3"	6'-0"
	"A" bars (Skew 0°-20°)	(III)	—	—	—	—	—	#10	#9	#9	#8	#8	#7	#7	#7	#7	#7
	"A" bars (Skew 21°-35°)	(III)	—	—	—	—	—	#11	#10	#9	#9	#8	#8	#8	#7	#7	#7
	"A" bars (Skew 36°-50°)	(III)	—	—	—	—	—	#14	#11	#10	#10	#9	#8	#8	#8	#7	#7
	Stirrup Spacing	(III)	—	—	—	—	—	#6@6	#6@6	#6@6	#6@6	#6@7	#6@7	#6@7	#6@8	#6@8	#6@8
	45T Pile Spacing *	(V)	9'-9"	8'-9"	8'-0"	7'-6"	7'-3"	6'-3"	5'-9"	5'-0"	—	—	—	—	—	—	—
	"A" bars (Skew 0°-20°)	(V)	#7	#7	#7	#6	#6	#6	#6	#6	—	—	—	—	—	—	—
	"A" bars (Skew 21°-35°)	(V)	#7	#7	#7	#7	#7	#7	#6	#6	—	—	—	—	—	—	—
	"A" bars (Skew 36°-50°)	(V)	#8	#8	#8	#7	#7	#7	#7	#6	—	—	—	—	—	—	—
	Stirrup Spacing	(V)	#5@10	#5@10	#5@10	#5@10	#5@10	#6@6	#6@6	#6@6	—	—	—	—	—	—	—
	70T Pile Spacing *	(V)	—	—	—	—	10'-6"	9'-3"	8'-6"	8'-0"	7'-6"	7'-3"	6'-6"	6'-0"	5'-6"	5'-3"	5'-0"
	"A" bars (Skew 0°-20°)	(V)	—	—	—	—	#9	#9	#8	#8	#7	#7	#7	#7	#7	#7	#7
	"A" bars (Skew 21°-35°)	(V)	—	—	—	—	#10	#10	#9	#8	#8	#8	#7	#7	#7	#7	#7
	"A" bars (Skew 36°-50°)	(V)	—	—	—	—	#11	#11	#10	#10	#9	#9	#8	#7	#7	#7	#7
	Stirrup Spacing	(V)	—	—	—	—	#6@10	#6@5	#6@6	#6@6	#6@6	#6@7	#6@7	#6@7	#6@8	#6@8	#6@8
	45T Pile Spacing *	(VI)	12'-0"	11'-9"	10'-6"	9'-9"	9'-0"	8'-3"	7'-6"	7'-3"	7'-0"	6'-3"	6'-0"	5'-9"	5'-0"	—	—
	"A" bars (Skew 0°-20°)	(VI)	#9	#9	#8	#8	#8	#7	#7	#7	#7	#6	#6	#6	#6	—	—
	"A" bars (Skew 21°-35°)	(VI)	#10	#10	#9	#9	#8	#8	#7	#7	#7	#7	#7	#7	#6	—	—
	"A" bars (Skew 36°-50°)	(VI)	#11	#11	#10	#10	#9	#9	#8	#8	#8	#8	#8	#7	#7	—	—
	Stirrup Spacing	(VI)	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	#5@7	—	—
	70T Pile Spacing *	(VI)	—	—	—	—	—	—	—	10'-6"	10'-0"	9'-3"	9'-0"	8'-0"	8'-0"	7'-6"	7'-3"
	"A" bars (Skew 0°-20°)	(VI)	—	—	—	—	—	—	—	#10	#9	#9	#9	#9	#9	#8	#8
	"A" bars (Skew 21°-35°)	(VI)	—	—	—	—	—	—	—	#10	#10	#10	#10	#9	#9	#9	#9
	"A" bars (Skew 36°-50°)	(VI)	—	—	—	—	—	—	—	#14	#11	#11	#11	#10	#10	#10	#10
	Stirrup Spacing	(VI)	—	—	—	—	—	—	—	#6@6	#6@6	#6@6	#6@6	#6@6	#6@6	#6@6	#6@6
ABUTMENT	45T Pile Spacing *	(I)	12'-0"	11'-6"	11'-3"	10'-6"	10'-6"	10'-0"	9'-6"	9'-3"	8'-9"	8'-6"	8'-0"	7'-9"	7'-6"	7'-3"	7'-0"
	70T Pile Spacing *	(I)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	45T Pile Spacing *	(V)	12'-0"	12'-0"	11'-6"	11'-3"	11'-0"	11'-0"	10'-9"	10'-6"	10'-3"	10'-0"	9'-6"	9'-3"	8'-9"	8'-6"	8'-3"
	70T Pile Spacing *	(V)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	45T Pile Spacing *	(VI)	11'-0"	10'-6"	10'-3"	9'-9"	9'-3"	8'-9"	8'-6"	8'-0"	7'-6"	7'-3"	6'-9"	6'-6"	6'-3"	5'-9"	5'-6"
	70T Pile Spacing *	(VI)	—	—	—	—	—	—	—	—	11'-9"	11'-3"	10'-9"	10'-3"	9'-9"	9'-3"	8'-9"
		Support Type	16'	18'	20'	22'	24'	26'	28'	30'	32'	34'	36'	38'	40'	42'	44'
			LENGTH OF SPAN "L"														

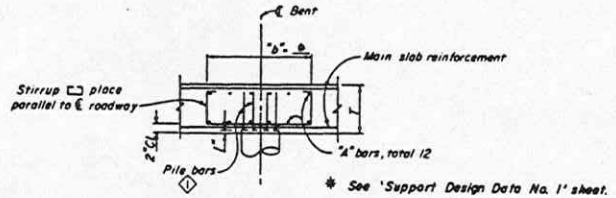
* Note: Pile Spacing Above Are For No Skew Conditions, ie (Normal)



ABUTMENT SECTION



BENT CAP - SPANS 16'-24'



BENT CAP - SPANS 26'-44'

① Rebar revised ④ Berm revised
◇ Notes deleted
◇ Note revised.

STANDARD SLAB BRIDGE
SUPPORT DESIGN DATA NO. 2

STANDARD SLAB BRIDGE TYPICAL SUPPORT CALCULATIONS

Example No. 1

Bridge width: 35'-6" (32' Roadway)
Length of Span: L = 32'
Type of Support: IV (Abutment)
Allowable Pile value: 45 tons = 90 kips
No Skew
Pile calculations from table: L = 32' Support Type IV
90 kip Pile Spacing = 10'-3"

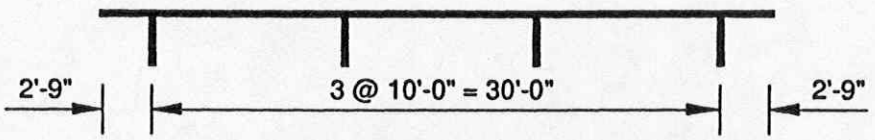
$$\text{No. of Piles required} = \left[\frac{\text{Bridge Width} - (2 \times \text{Edge Distance to Piles})}{10.25}\right] + 1$$

$$= \left[\frac{35.5 - (2 \times 2)}{10.25}\right] + 1$$

$$= 3.07 + 1$$

$$= 4.07$$

USE 4 PILES



PILE SPACING DIAGRAM

Example No. 2

Bridge width: 35'-6" (32' Roadway)
Length of Span: L = 42'
Type of Support: V (Bent)
Allowable Pile value: 70 tons = 140 kips
Skew Angle 46°
Pile calculations from table: L = 42' Support Type V
140 kip Pile Spacing = 5'-3"

$$\text{Skewed Pile Spacing} = \left(\frac{5.25}{\cos 46°}\right) = 7.56$$

Max. edge dist. to support = 0.4 Pile Spacing
= 0.4(7.56)
= 3.00'

$$\text{Length of Support} = \left(\frac{35.5}{\cos 46°}\right) = 51.1$$

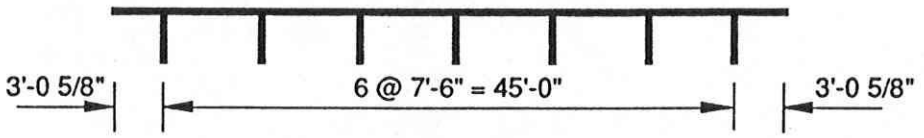
$$\text{No. of Piles required} = \left[\frac{\text{Length of Support} - (2 \times \text{Edge Dist. to Pile})}{7.56}\right] + 1$$

$$= \left[\frac{51.1 - (2 \times 3)}{7.56}\right] + 1$$

$$= 6.97$$

USE 7 PILES

Pile Spacing = 7'-6"
Edge Distance to Exterior Pile = $\left[\frac{51.1 - (6 \times 7.5)}{2}\right] = 3.05'$



PILE SPACING DIAGRAM

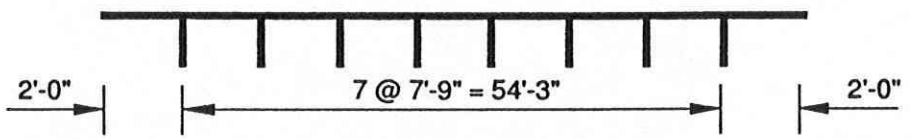
Bent Cap Reinforcement: "A" bars #7
Stirrup #6 @ 8

Example No. 3

Bridge width: 58'-3" ave (54'-9" ave Roadway)
Length of Span: L = 32'
Type of Support: II (Bent)
Allowable Pile value: 70 tons = 140 kips
No Skew
Pile calculations from table: L = 32' Support Type II
140 kip Pile Spacing = 8'-0"

No. of Piles required = $\left[\frac{58.25 - (2 \times 2)}{8}\right] + 1$
= 7.78
USE 8 PILES

Pile Spacing = 7'-9"
Edge Distance to Centerline Exterior Pile = $\left[\frac{58.25 - (7 \times 7.75)}{2}\right] = 2.0'$



PILE SPACING DIAGRAM

Bent Cap Reinforcement: "A" bars #8
Stirrup #6 @ 7

Example No. 4

Bridge width: 35'-6" (32' Roadway)
Length of Span: L = 30'
Type of Support: I (Abutment)
Allowable Pile value: 45 tons = 90 kips
Skew Angle: 39°
Pile calculations from table: L = 30' Support Type I
90 kip Pile Spacing = 9'-3"

$$\text{Skewed Pile Spacing} = \left(\frac{9.25}{\cos 39°}\right) = 11.9'$$

$$\text{Length of Support} = \left(\frac{35.5}{\cos 39°}\right) = 45.68'$$

Maximum edge distance to support = 0.4 Pile Spacing, try 3'

$$\text{No. of Piles required} = \left[\frac{45.68 - (2 \times 3)}{11.9}\right] + 1$$

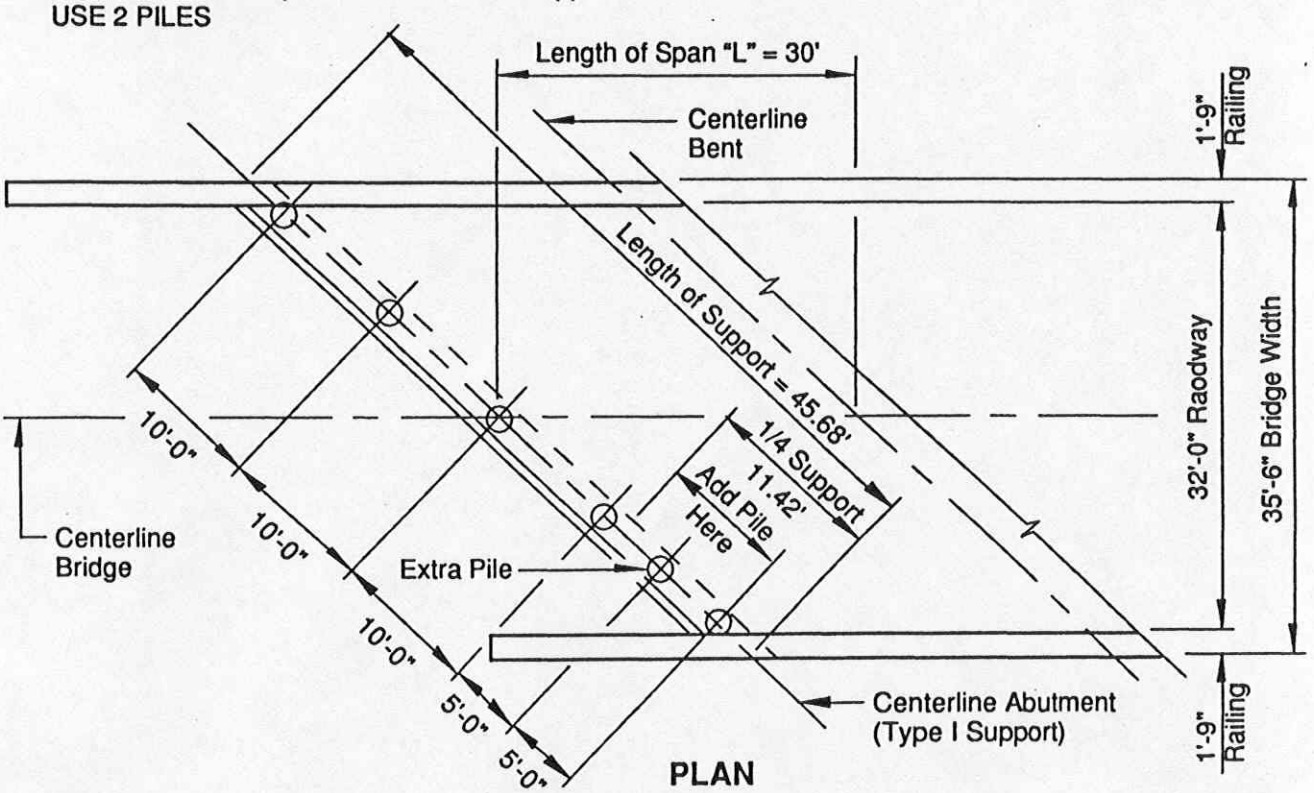
$$= 4.33$$

USE 5 PILES

Pile Spacing = 10'-0"

$$\text{Edge Distance to Centerline Exterior Pile} = \left[\frac{45.68 - (4 \times 10)}{2}\right] = 2.84' = 2'\text{-}10\ 1/8"$$

Skew Angle: 39°
Reaction Coefficient: "K" = 0.40
Number of Piles required under end 1/4 support at Obtuse Corner 5 x 0.4 = 2
USE 2 PILES



PLAN

Example No. 5

Bridge width: 55'-6" (52' Roadway)
Length of Span: L = 24'
Type of Support: V I (Expansion Bent)
Allowable Pile value: 70 tons = 140 kips
Skew Angle: 18° 30'
Pile calculations from table: L = 24' Support Type VI
90 kip Pile Spacing = 9'-0"

$$\text{140 kip Pile Spacing} = \left(\frac{9 \times 140}{90}\right) = 14' > 10'\text{-}6" \text{ max. cap span from chart}$$

$$\text{Skewed Pile Spacing} = \left(\frac{10.5}{\cos 18.5°}\right) = 11.07'$$

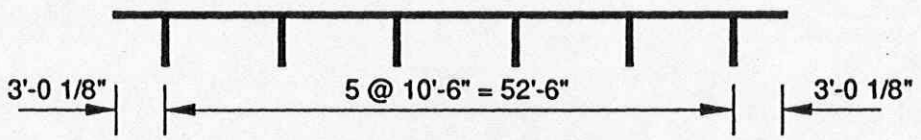
$$\text{Length of Support} = \left(\frac{55.5}{\cos 18.5°}\right) = 58.52'$$

$$\text{Minimum edge distance for Pile into a drop cap} = \left(\frac{2.5}{\cos 18.5°}\right) = 2.64'$$

$$\text{No. of Piles required} = \left[\frac{58.52 - (2 \times 2.64)}{11.07}\right] + 1$$

$$= 5.80$$

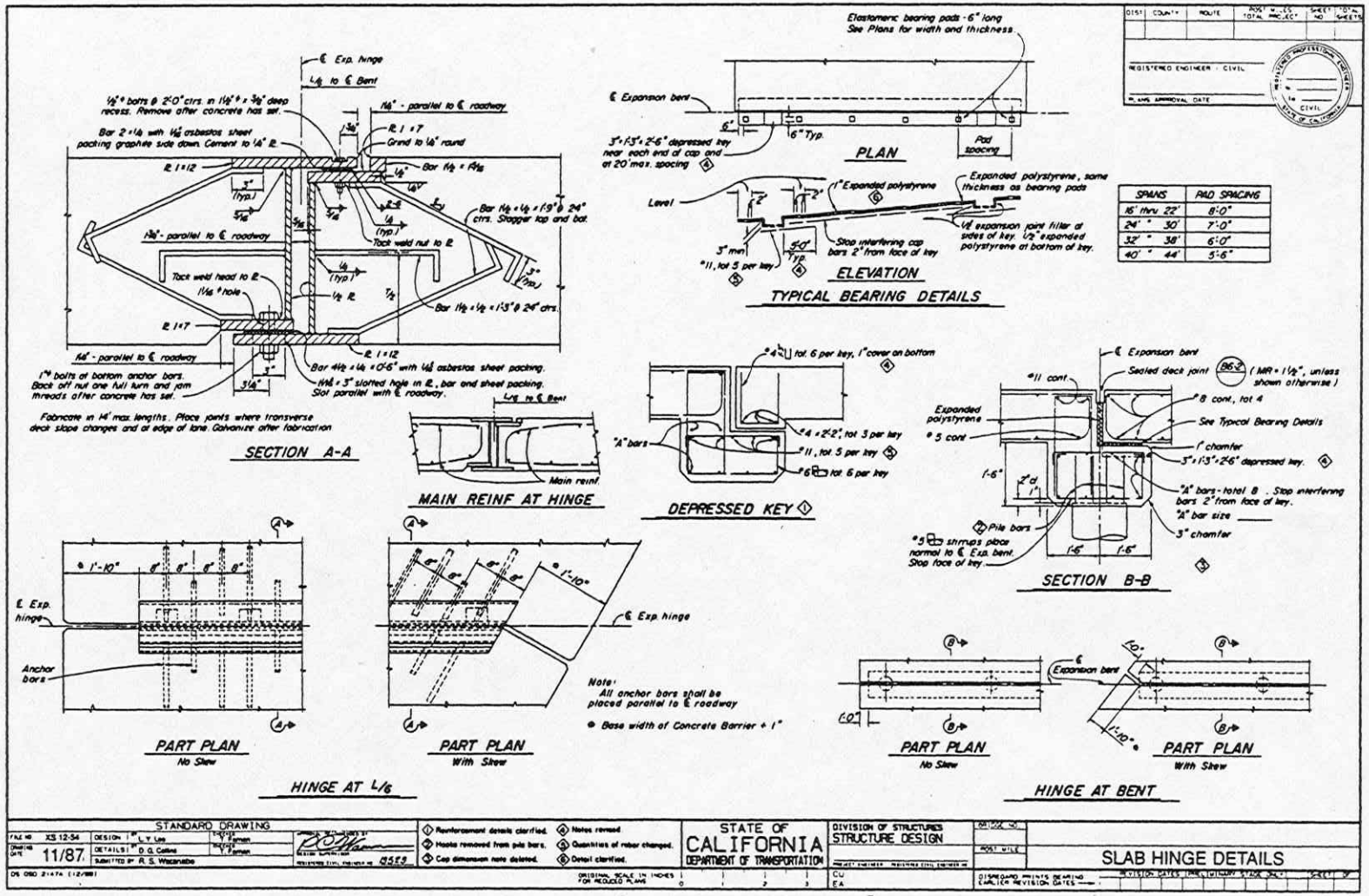
USE 6 PILES



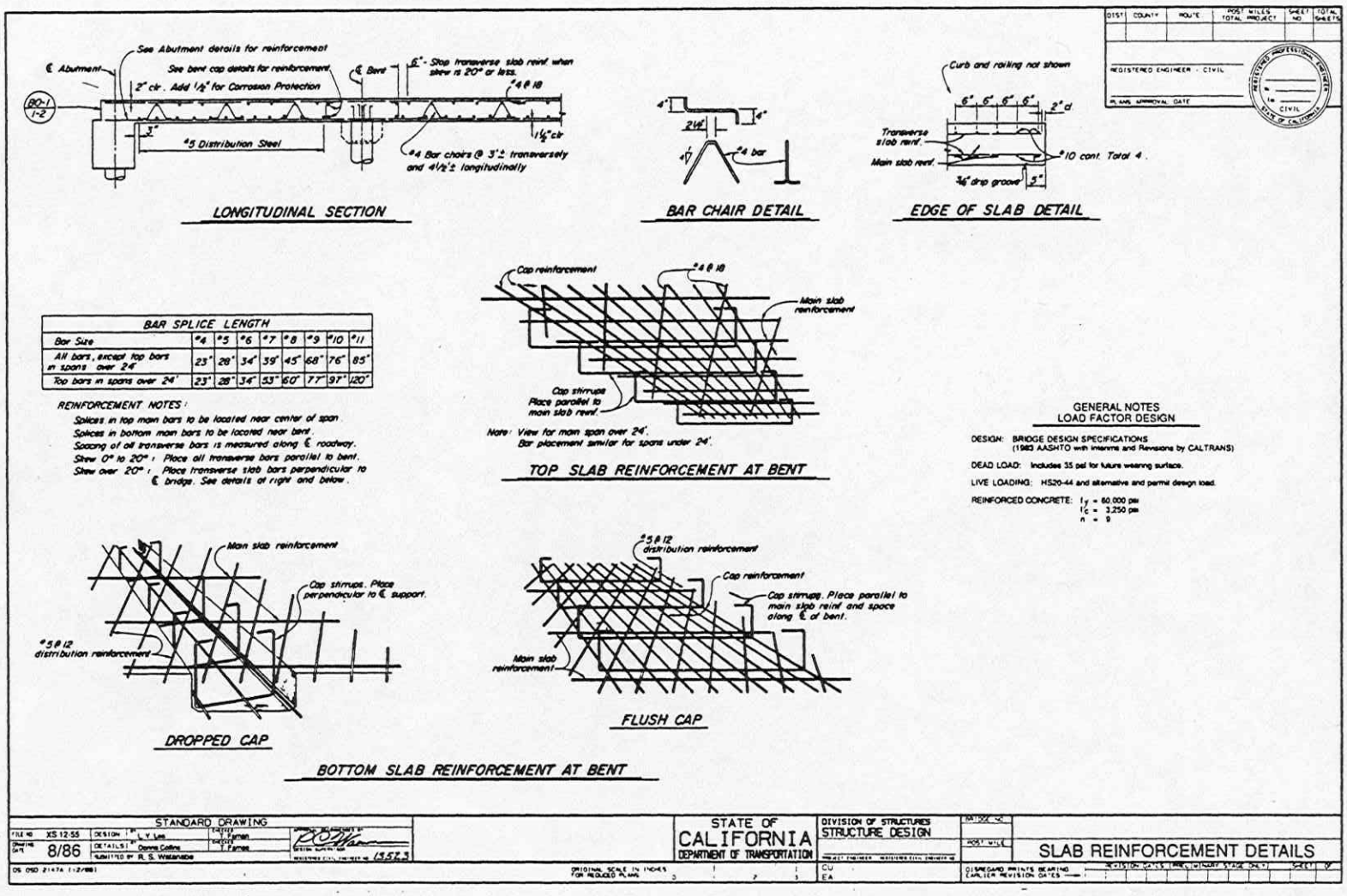
PILE SPACING DIAGRAM

Bent Cap Reinforcement from table: Support Type VI
140 kip Pile Spacing @ 10'-6", "A" Bars #10
Stirrup #6 @ 6

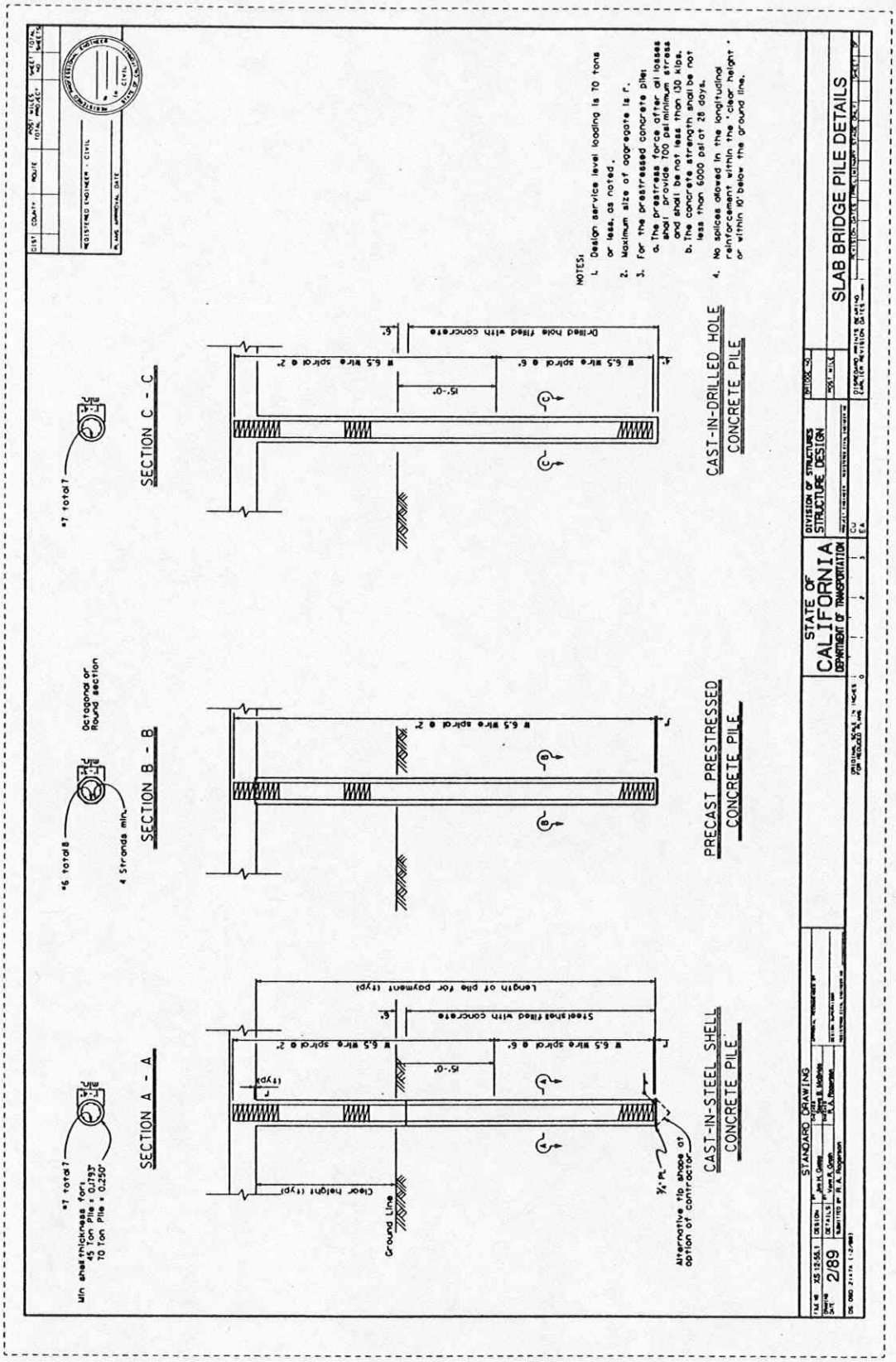
One pile per bent could be saved by designing a larger cap.



Note to Designer: 1'-10" edge clearance of metal assembly is for Concrete Barrier Type 25. Change to 1'-6" when Concrete Barrier Type 27 is used to provide 1" clearance. Specify bearing thickness and width, Joint Seal MR and Waterstop on the detail plans. Use of Steel Hinge Detail at L/6 should be avoided as much as possible.



Note to Designer: Clearances shown for top reinforcement on longitudinal sections should be increased for Marine Environment.


SECTION A - A
SECTION B - B
SECTION C - C
CAST-IN-STEEL SHELL CONCRETE PILE
PRECAST PRESTRESSED CONCRETE PILE
CAST-IN-DRILLED HOLE CONCRETE PILE
Min shell thickness for: 45 Ton Pile = 0.1793" 70 Ton Pile = 0.250"
#7 total 7
#6 total 8
4 Strands min.
Octagonal or Round section
Ground Line
Clear height (typ)
Length of pile for payment (typ)
Steel shell filled with concrete
Drilled hole filled with concrete
W 6.5 Wire spiral @ 2"
W 6.5 Wire spiral @ 6"
15'-0"
Alternative tip shape at option of contractor
NOTES:
1. Design service level loading is 70 tons or less, as noted.
2. Maximum size of aggregate is 1".
3. For the prestressed concrete pile:
a. The prestress force after all losses shall provide 700 psi minimum stress and shall be not less than 130 kips.
b. The concrete strength shall be not less than 6000 psi at 28 days.
4. No splices allowed in the longitudinal reinforcement within the "clear height" or within 10' below the ground line.
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF STRUCTURES
STRUCTURE DESIGN
SLAB BRIDGE PILE DETAILS
STANDARD DRAWING
2/89